Installation and Operating Manual

MX 32

2 CHANNEL CONTROLLER

MX32

OLDHAM

OLDHAM

The Fixed Gas Detection People

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Table of Contents

Chapter 1 | General Information

The User's Guide

Please read the following notice carefully before installation and start-up, paying particular attention to the end-user safety instructions. This user's guide should be distributed to every individual involved in the start-up, use, maintenance or repair of the system. The information contained in this manual, the data and technical drawings are correct as of the date of publication. Should questions arise, please contact *Oldham* for additional information.

This manual is designed to provide users with simple and precise information. *Oldham* shall not be held responsible or liable for any misinterpretation that may result from the reading of this manual. Although every effort is made to ensure accuracy, this manual may contain unintentional technical inaccuracies.

On behalf of its clients, *Oldham* reserves the right to modify the technical characteristics of its equipment, without notice, to improve product performance. This user manual and its contents are the inalienable property of *Oldham*.

Symbols used

Icon	Meaning
	This symbol indicates useful additional information.
	This symbol indicates: This equipment must be grounded.
	This symbol indicates: Safety grounding terminal. A cable of adequate diameter must ground any terminal with this signal.
	This symbol indicates: **Caution: In the current operating mode, failure to adhere to the instructions preceding this symbol can result in a risk of electric shock or death.**
	This symbol indicates: Please refer to the instructions.
	Double isolation.

European Union (and EEA) only. This icon indicates that in accordance with Directive DEEE (2002/96/EC) and with the regulations of your country, this product may not be disposed with household waste.

Dispose of this product at a collection site intended for electrical waste, for example an official EEE (Electrical and Electronic Equipment) collection site with a recycling or take-back program for authorized products available to consumers whose purchases replace old EEE products with new equivalents.

Failure to comply with regulations for the disposal of this type of waste can be harmful to the environment and to public health, as EEE products typically contain potentially hazardous substances. Your complete cooperation in the disposal of this product will help to ensure a more efficient use of natural resources.

Safety Warnings

Icons have been placed on the central controller to call attention to general use safety precautions. These labels are an integral component of the central controller. Replace any label that has peeled off or become illegible. The meanings of these labels are explained below.

Installation and electrical connections must be performed by a qualified professional, according to the manufacturer's specifications and to the standards of authorities in the field.

Failure to observe these rules may result in serious injury. Exactness, particularly regarding electricity and assembly (couplings, network connections) is imperative.

Important Information

The modification of any component or the use of any third party components will automatically void any and all guarantees.

The central controller is intended to be used for precise applications of a technical nature. Exceeding the indicated values is strictly prohibited.

Limitation of liability

Neither *Oldham* nor any other affiliated organization shall be held liable under any circumstances for any damage whatsoever including, without limitations, damages for loss of production, interruption of production, loss of information, controller failure, personal injury, loss of time, money, or materials, or for any indirect or consecutive consequence of loss occurring during the use of the product or the inability to use the product, even in the event that *Oldham* had been informed of such damages.

Chapter 2 | General Introduction

Subject

The *MX 32* controller is intended for light units that do not require an electrical cabinet.

The *MX 32* measurement and alarm controller can measure 1 or 2 channels independently. Each channel is linked to one or more sensors installed in the locations being monitored. The measurement from the sensor is displayed on the *MX 32* controller and compared to the alarm thresholds. In the event that the measurement exceeds the threshold, the controller activates the relays which can be used to control external components.

View: Front internal

The *MX 32* controller is composed of the following components:

- A wall-mounted enclosure (ref. A) equipped with a terminal cover (ref. F), a faceplate (ref. C) and a transparent hinged cover (ref. D) ;
- a power supply board (analog) (ref. E) ;
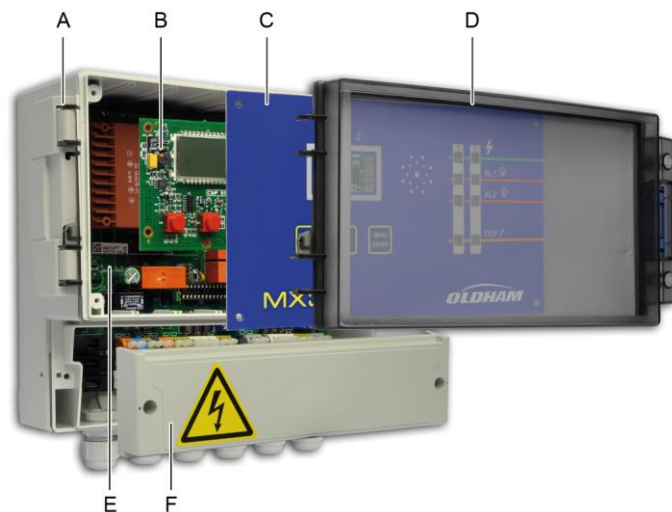- a display card (microprocessor) (ref. B).

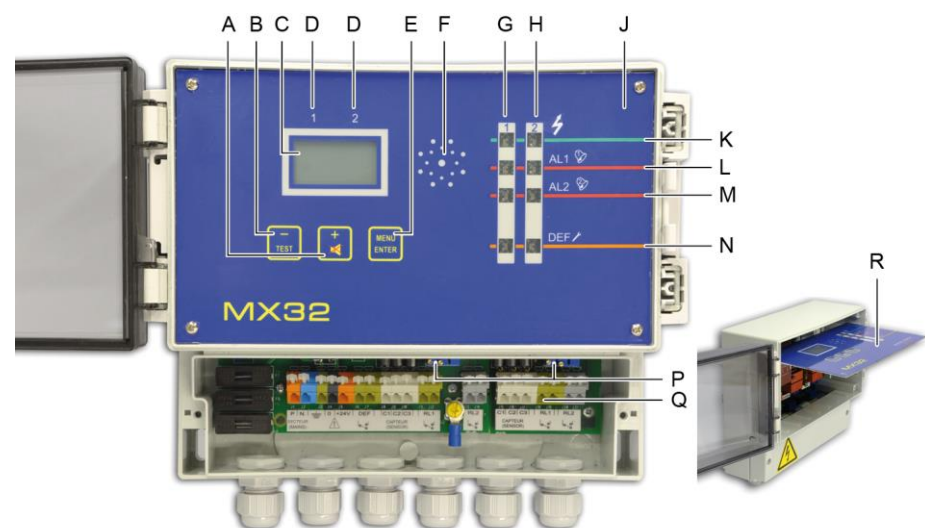**Figure 1: Overall view of the *MX 32* controller components.**

View: Front

Figure 2: Full view of the *MX 32* controller.

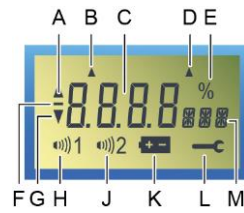| Ref.	Function
A.	Button to increase the value displayed or flip to the next menu/option.
B.	Button to decrease the value displayed or flip to the previous menu/option.
C.	LCD screen displaying measurements, menus and options.
D.	Labels, for the LCD screen, indicating the display for *Channel 1* or *Channel 2*.
E.	Menu access button. See page 16.
	Button to confirm the value displayed.
F.	*Buzzer* activated in the case of fault or alarm if authorization is granted. See page 31.
G.	LEDs for *Channel 1*.
H.	LEDs for *Channel 2*.
J.	Removable faceplate; also see ref. R.
K.	LED lights up when the channel is active.
L.	Alarm threshold for level 1. LED lights up when the alarm threshold is exceeded or when programming the alarm threshold for the channel.
M.	Alarm threshold for level 2. LED lights up when the alarm threshold is exceeded or when programming the alarm threshold for the channel.
N.	Fault LED
	■ Lights up when there is a fault in the channel.
	■ Blinks during programming of the channel.
P.	Access to the zero and sensitivity settings (Figure 4, ref. O to R).
Q.	Connection terminals (sector, 24VDC, sensors, dry alarm contacts); front view with protective cover removed.
R .	Removable faceplate in maintenance position.

LCD Information

Figure 3: LCD Information.

Ref.	Function	See page
A.	Indicator for alarm threshold rising.	13
B.	Indicator that *Channel 1* is selected. See Figure 2, ref. D.	14
C.	Digital indicator (measurement value, alarm threshold value, etc.)	13
D.	Indicator that *Channel 2* is selected. See Figure 2, ref. D.	14
E.	Percent symbol.	18
F.	Negative sign.	
G.	Indicator for alarm threshold falling.	18
H.	Symbol indicating level 1 alarm threshold (AL1) activated.	18
J.	Symbol indicating level 2 alarm threshold (AL2) activated.	18
K.	Time delay after calibration (blocking the relays): the yellow LED blinks and the icon is displayed.	18
L.	A *Maintenance key* icon is displayed while the programming and calibration menu is being used.	18

View: Internal
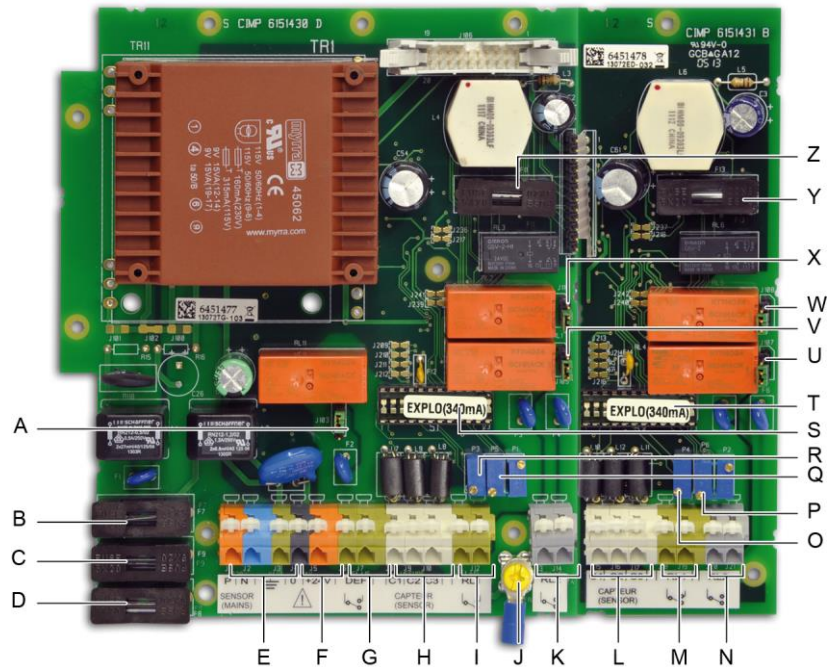
Figure 4: Internal view.

Ref.	Function	See page
A.	Configuration jumper (J03) for *Fault* relay settings. ■ Up position: *Fault* relay contact closed in alarm mode. ■ Down position: *Fault* relay contact open in alarm mode.	10
B.	F7 Fuse (5x20, 250 V AC - 2 A T) with 24V DC power supply.	8
C.	F9 Fuse: ■ 5x20, 250 V AC - 160 mA T with 230 VAC power supply. ■ 5x20, 250 V AC - 315 mA T with 115 VAC power supply.	8
D.	F8 Fuse: ■ 5x20, 250 V AC - 160 mA T with 230 VAC power supply. ■ 5x20, 250 V AC - 315 mA T with 115 VAC power supply.	8
E.	Sector power supply terminal (230 V AC or 110 V AC upon request) with the following identifications: P (phase), N (neutral) and ⏚ (ground).	8
F.	Power terminal block 24 V DC (0, + 24V).	8
G.	*Fault* relay terminal block. Contacts RCT, 250 V AC – 2 A. Contact status not in alarm mode as defined by J03 (ref. A).	10
H.	Terminal block connection for channel #1 sensor.	9
I.	Relay terminal block *RL 1 - Channel 1*. Contacts RCT, 250 V AC – 2 A. Contact status not in alarm mode as defined by J10 (ref. X).	10
J.	Secondary ground connection.	8
K.	Relay terminal block *RL 2 - Channel 1*. Contacts RCT, 250 V AC – 2 A. Contact status not in alarm mode as defined by J05 (ref. V).	10
L.	Terminal block connection for channel #2 sensor.	9
M.	Relay terminal block *RL 1 - Channel 2*. Contacts RCT, 250 V AC – 2 A. Contact status not in alarm mode as defined by J08 (ref. W).	10
N.	Relay terminal block *RL 2 - Channel 2*. Contacts RCT, 250 V AC – 2 A. Contact status not in alarm mode as defined by J07 (ref. U).	10
O.	Zero settings (P4) for channel #2.	26
P.	Sensitivity settings (P6) for channel #2.	27
Q.	Sensitivity settings (P5) for channel #1.	26
R.	Zero settings (P3) for channel #1.	27
S.	Programming circuit (Explo 340 mA or 4-20 mA) for channel #1.	-
T.	Programming circuit (Explo 340 mA or 4-20 mA) for channel #2.	-
U.	Configuration jumper (J07) for *Alarm 2*, channel #2 relay. ■ Up position: relay contact closed in alarm mode. ■ Down position: relay contact open in alarm mode.	-
V.	Configuration jumper (J05) for *Alarm 2*, channel #1 relay. ■ Up position: relay contact closed in alarm mode. ■ Down position: relay contact open in alarm mode.	-
W.	Configuration jumper (J08) for *Alarm 1*, channel #2 relay. ■ Up position: relay contact closed in alarm mode. ■ Down position: relay contact open in alarm mode.	-
X.	Configuration jumper (J10) for *Alarm 1*, channel #1 relay. ■ Up position: relay contact closed in alarm mode. ■ Down position: relay contact open in alarm mode.	-
Y.	F13 Fuse (5x20, 250 V AC – 630 mA T).	-
Z.	F11 Fuse (5x20, 250 V AC – 630 mA T).	-

*alarm relays are configured as energized at the factory. This means that they are supplied with power when not in alarm.

Chapter 3 | Installation and wiring
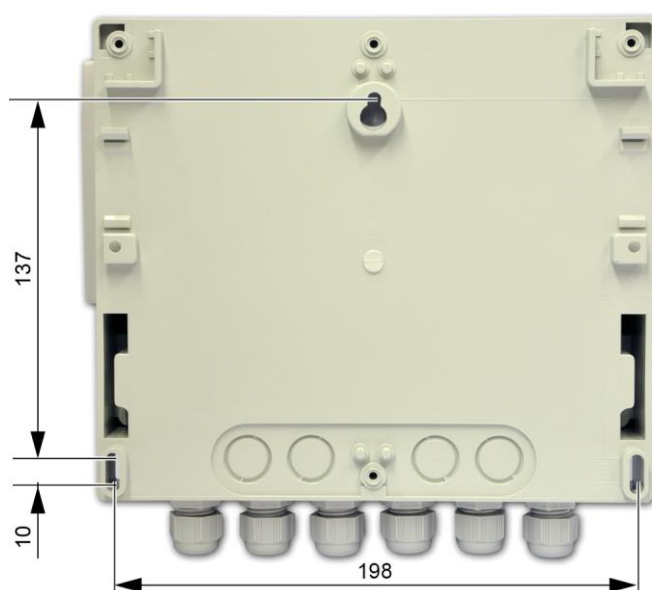
Mounting the controller

The MX 32 controller can be installed in any location except for explosive atmospheres. Ideally, the controller should be located in an area under surveillance (security office, control room, equipment room, etc.).

The central controller cover opens at a 90° angle to the left. Make sure to leave adequate space to completely open the cover once the central controller is mounted.
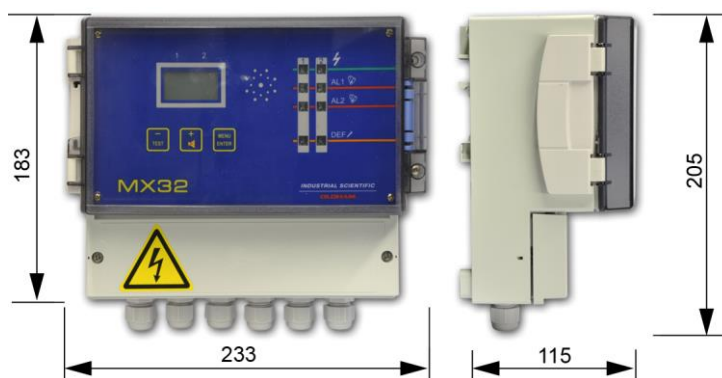
Figure 5: Dimensions of the controller

The dimensions for the wall-mounting of the enclosure are indicated on the back.

Figure 6: drilling dimensions for mounting the controller with three M4 screws.

Wiring

> ⚠️ Before installing the controller, cut off the power supply.
>
> Also refer to the *Particular Specifications* chapter on page 39.

The controller is intended for use in installation areas that meet Class II overvoltage requirements and Degree 2 pollution requirements.

The electrical connection must be:

- Performed by a specialist and conform to current regulations in force ;
- Compliant with NF C 15-100.

Verify the current and the grid power supply (the grid power supply must correspond to the supply indicated on the controller front plate). The operating voltage is configured at the factory.

> ⚠️ The *MX 32* does not have an on/off switch.
>
> Certain power supplies can cause serious or fatal injury. All installation and wiring should be performed before turning on the power supply.
>
> Incorrect installation can lead to measurement errors or system failure, all instructions in this manual must be followed carefully to guarantee proper system operation.

Ground Connection Protection

The controller must be connected to a functional ground connection.

The ground terminal (yellow) (Figure 4, ref. J) is indicated with the following symbol: ⏚.

The cable used must have a minimum diameter of 1.5 mm² and a maximum diameter of 2.5 mm².

Refer to the wiring examples beginning on page 11.

Power

The MX 32 must be protected upstream by a differential bipolar circuit breaker. The response curve must be type D.

Power supply	115 V AC	230 V AC
Differential bipolar circuit breaker caliber	2 x 2 A	2 x 1 A

The cable used must have a minimum diameter of 1.5 mm² and a maximum diameter of 2.5 mm².

There are two options for transformers suggested for use as a power supply for the *MX 32*.

- Bobbin transformer (standard default).
- Toric Transformer (for connecting special sensors such as flame sensors, etc.).

Power supply 230 V AC

The sector power supply must be wired to the two terminals marked P (orange) and N (blue) (Figure 4, ref. E) on the 12 point terminal block for the power supply card; also see the wiring example on page 11. Protection is provided by fuses F8 and F9 (160 mA/250 VAC) (Figure 4, ref. C and ref. D).

Power supply 115 V AC

Protection is provided by fuses F9 and F8 (315mA/250 VAC) (Figure 4, ref. C and ref. D).

Power supply 24 V DC

Must be connected to the terminals marked 0 (grey) and +24V (orange) on the 12 point terminal block for the power supply card (Figure 4, ref. F) as indicated by the wiring example on page 11. Protection is provided by fuse F7 (2A/250 VAC) (Figure 4, ref. B).

Measurement Channels

The *MX 32* controller can be equipped with one or two adjustable and dual measurement channels (see Figure 7). Three options are suggested at purchase:

- *MX 32* with 2 measurement channels (dual);

- *MX 32* with 1 measurement channel (dual);

- 1 extension card (to add on to a 1-channel controller).

The *MX 32* controller will automatically recognize the number of measurement channels installed (display).
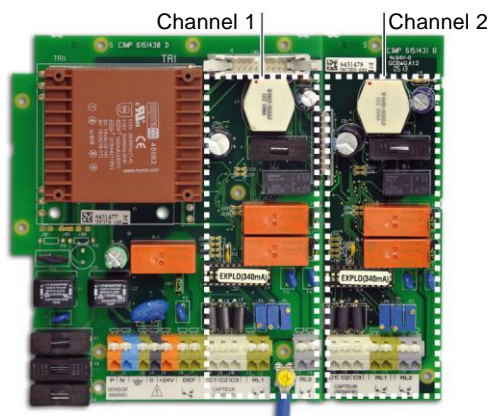
Figure 7: the 2 measurement channels for the controller.

Sensors

The sensors must be connected to points C1, C2 and C3 on the 12 point connector for each channel card, as indicated on the wiring example on page 10.

Wheatstone bridge 3 active wire explosive gas detectors

- C1: mid-point (signal).

- C2: detector filament.

- C3: compensator filament.

4/20 mA 2 active wire sensors/transmitters

- C1: signal (return to ground).

- C2: not connected

- C3: positive power supply (+24 Volts).

4/20 mA 3 active wire sensors/transmitters

- C1: signal (return to ground).

- C2: power supply (0 Volts).

- C3: positive power supply +24 Volts.

Note

For each family of sensors, on the measurement channel circuits:

- Programming will be carried out by *Oldham* (programming circuit pads).

- A programming circuit (Explo 340 mA or 4-20 mA) will be inserted on the mounting by the manufacturer (Figure 4, ref. S and T).

Alarm relays

The *MX 32* controller uses two alarm relays per measurement channel which correspond to two instant pre-programmed alarm thresholds 1 and 2.The relays are energized (de-energized available on request) and voltage-free.

- The relay corresponding to alarm 1 is connected to the RL1 (green) terminals on the 12 point connector for each channel card.

- The relay corresponding to alarm 2 is connected to the RL2 (grey) terminals on the 12 point connector for each channel card.

The relay contacts can be used "normally open" (NO) or "normally closed" (NC) by flipping the corresponding switch (Figure 4, ref. U or V for *AL1* alarms and references W and X for *AL2* alarms).

Refer to the wiring examples beginning on page 11.

Relay fault

The *MX 32* controller uses one "Fault" alarm per measurement channel (visual and auditory) but a single shared "Fault" relay for both channels. The fault relay is energized and voltage-free. The shared fault relay can be connected to the points marked DEF (fault) on the 12 point terminal block for the power supply card.

The relay contact can be used "normally open" (NO) or "normally closed" (NC) by flipping the corresponding switch (Figure 4, ref. L).

Refer to the wiring examples beginning on page 11.

Wiring examples

The following pages contain two examples of wiring.

Contact alarm *Channel 2.*

Contact alarm *Channel 1.*

Fuse or circuit breaker

Grounding sector

0V DC
+24 V DC

Fuse

Telephonic transmitter

To the telephone line

Gas valve, closed when power is cut off*

The *AL1* and *AL2* relays can be programmed as energized or de-energized (factory settings). The fault relays are energized.

The contact relays are available on the NO or NC terminals according to the position of the switch next to each relay.

*Capacity to cut the power to relays 120 VA-30W resistive; use a relay with external power source if necessary.

Shared fault indicator

B4 → A4
B3 → A3
B2 → A2
B1 → A1
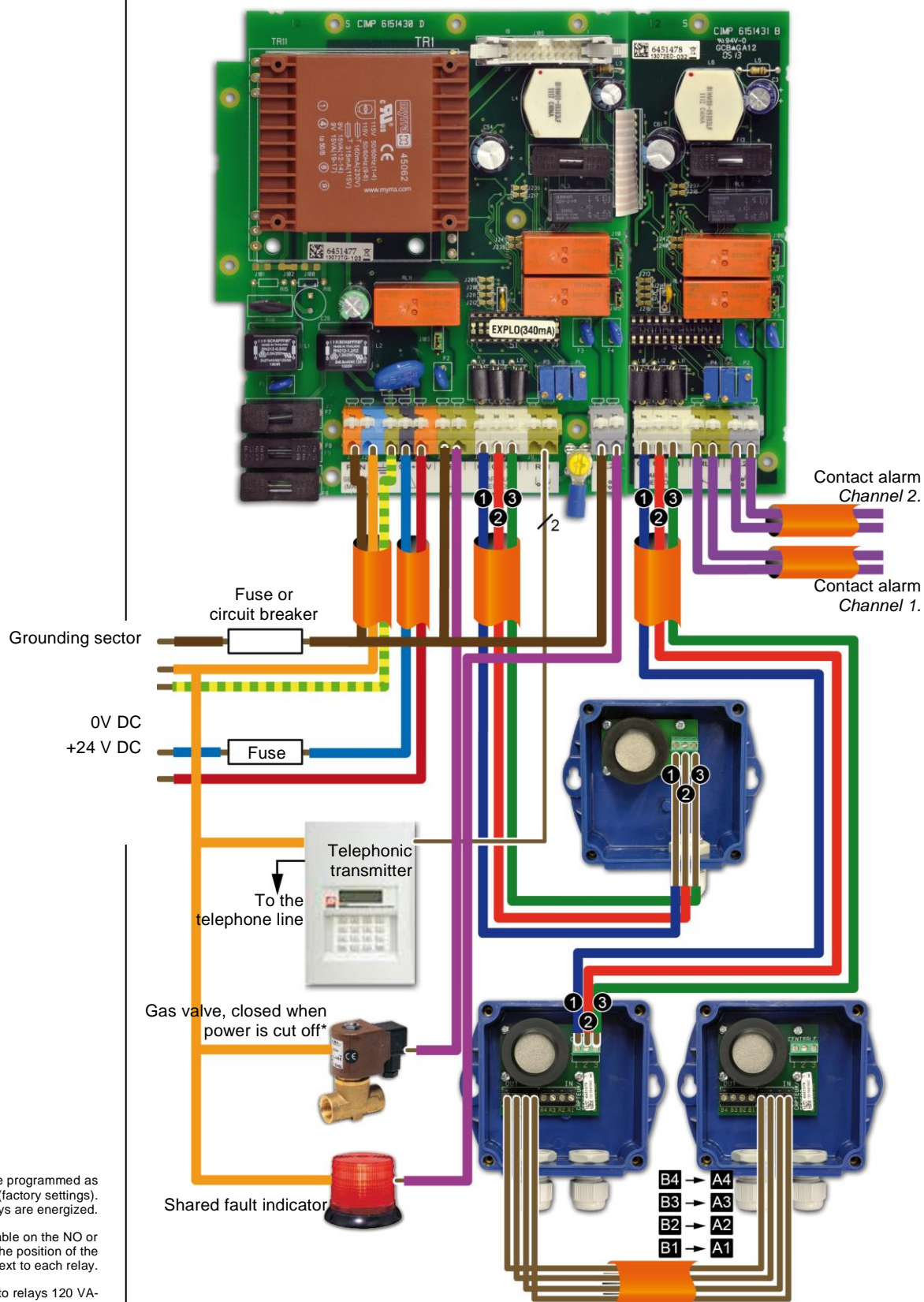
Figure 8: *MX 32* **controller with 1 explosive sensor on** *Channel 1* **and dual explosive sensors on** *Channel 2.*

Contact alarm
Channel 2.

Contact alarm
Channel 1.

Fuse or
circuit breaker

Grounding sector

0V DC
+24 V DC

Telephonic
transmitter

To the
telephone line

The *AL1* and *AL2* relays can be programmed as
energized or de-energized (factory settings).
The fault relays are energized.

The contact relays are available on the NO or
NC terminals according to the position of the
switch next to each relay.

*Capacity to cut the power to relays 120 VA-
30W resistive; use a relay with external power
source if necessary.

Gas valve, closed
when power is cut off*

Shared fault indicator
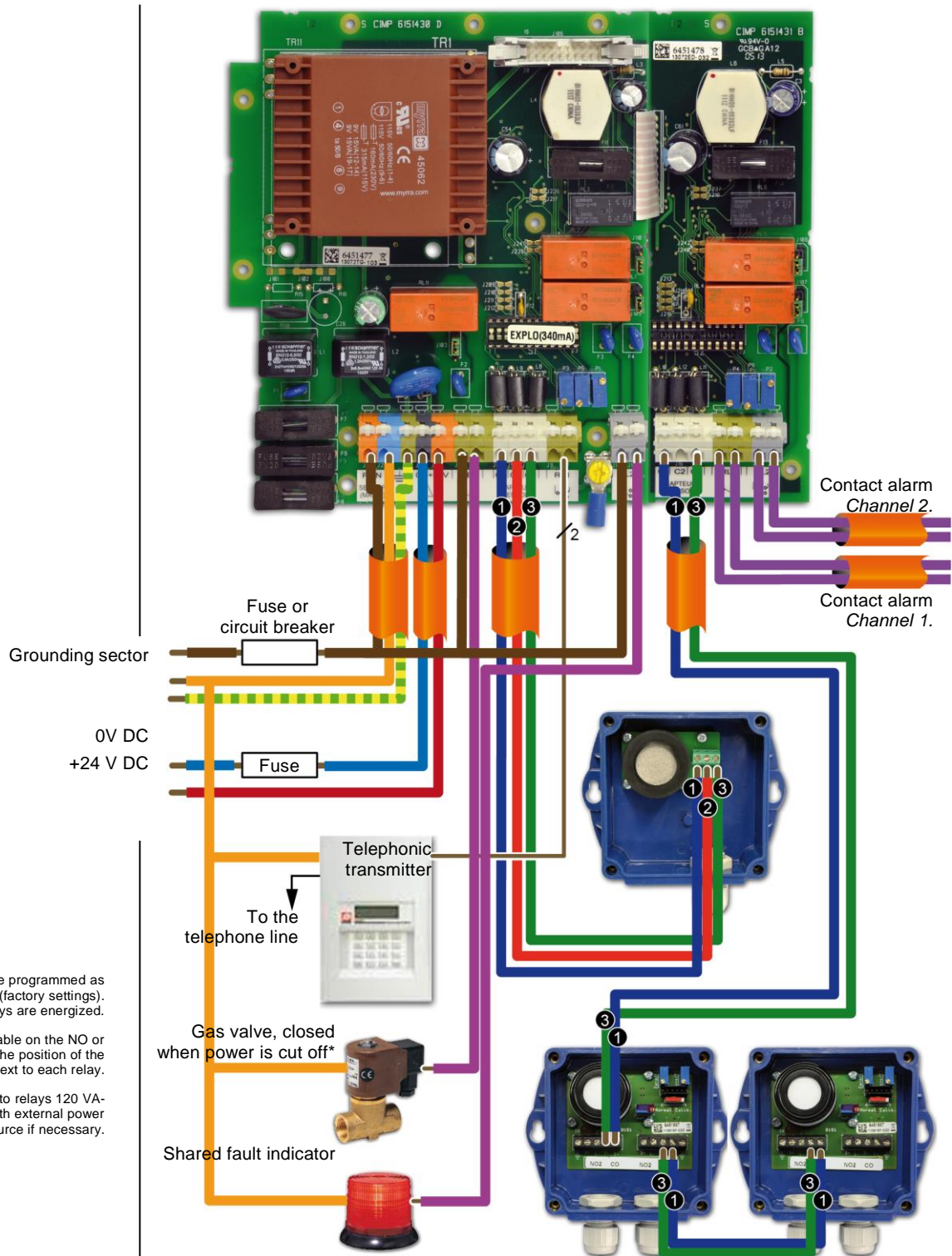
Figure 9: *MX 32* **controller with 1 explosive sensor on** *Channel 1* **and 2 parking CO sensors on** *Channel 2* **(maximum of 5 loop-connected sensors).**

Chapter 4 | Operating instructions

Displays

Indications for start-up

Action or result	Illustration
■ Current version of the software and *buzzer* test.	r 155ᵥₑᵣ
■ Access code for menus currently programmed.	1000
■ Display of current *AL1* threshold for channel #1. Simultaneously, the *AL1* and *Fault-channel 1* indicators light up.	▲ 20 ◖))1
■ Display of current *AL2* threshold for channel #1. Simultaneously, the *AL2* and *Fault-channel 1* indicators light up.	▲ 40 ◖))2
■ Display of current *AL1* threshold for channel #2. Simultaneously, the *AL1* and *Fault-channel 2* indicators light up.	▲ 20 ◖))1
■ Display of current *AL2* threshold for channel #2. Simultaneously, the *AL2* and *Fault-channel 2* indicators light up.	▲ 40 ◖))2
■ Time delay (in minutes) for (1) stabilization time for the measurement channels. During this time the two yellow *DEF* (fault) indicators are lit up. (*1) Time is factory set.*	0.52ₘᵢₙ

■ Cyclic display of the measurement channels.
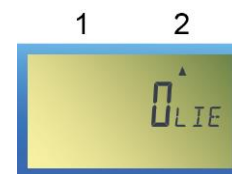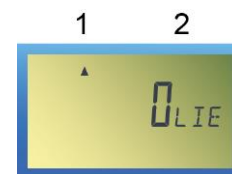
Note: The display alternates between the measurements of each of the activated channels (the unit and gas being detected is displayed).
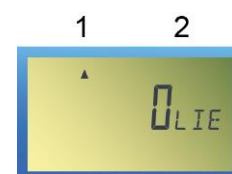
Temporary display of a measurement channel

Action or result	Illustration

■ Select the channel to be displayed:
  - Press [TEST] (**-**) to display *Channel 1*.
  - **OR** press [+] (**+**) to display *Channel 2*.	

■ Display of the measurement for the channel selected.	
... or.	
■ One minute later, if the [TEST] (**-**) or [+] (**+**) buttons are not pressed, the display will return to cyclic display of the two measurement channels (if in use).	

Cyclic display of the 2 measurement channels

Action or result	Illustration
■ Press 🔲 (**-**) AND 🔲 (**+**) together.	
■ The alternating display (cyclic) of the 2 measurement channels is now activated.	1 2 0 CH4 1 2 0 CH4

No display of measurements after manual display

Action or result	Illustration
■ Display is presented as shown in the illustration seen opposite (cyclic display).	1 2 0 CH4
■ Press 🔲 (**-**) **AND** 🔲 (**+**) together.	
■ The measurements disappear and are replaced by dashes. The *MX 32* controller continues to monitor the sensor(s) but the display is hidden.	1 2 - - - - OK

No display of measurements after cyclic display

Action or result	Illustration
■ Alternate (cyclic) display of the 2 measurement channels.	1 2 0 CH4 1 2 0 CH4
■ Press 🔲 (**-**) **AND** 🔲 (**+**) together.	

- The measurements disappear and are replaced by dashes. The *MX 32* controller continues to monitor the sensor(s) but the display is hidden.

1   2

- - - - OK
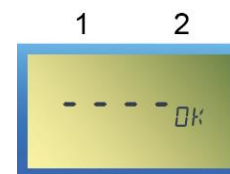
Navigating the menus

⚠ Reminder: for security reasons, only trained personnel (with access codes) are authorized to use the menus listed below.

To quit a menu at any stage, press the ⊟ (**-**) and ⊞ (**+**) buttons together.

Viewing the menus

Action or result	Illustration
■ Press the ⊡ button (**MENU/ENTER**).	
■ Request for access code. Note: the first number is blinking. If there is a response within one minute, the unit will return to normal mode.	0000 COD
■ Enter the first digit of the code. Press ⊟ (**-**): to decrease the number. Press ⊞ (**+**): to increase the number. Press ⊡ (**ENTER**): to confirm the number.	
■ Proceed to the next stage for each of the other 3 numbers in the code.	
■ Final display of the access code.	1000 COD
■ Confirm the code by pressing ⊡ (**MENU/ENTER**).	
■ The menu flashing **PRG** (*Programming*) is displayed. See page 18 for instructions on using this menu.	PRG
■ Press ⊞ (**+**) to display the **CAL** menu (*Calibration*). See page 23 for instructions on using this menu.	CAL

- Press 🔲 (**+**) to display the **INI** menu (*Initialization/Start-up*).
  See page 25 for instructions on using this menu.

INI

- Press 🔲 (**+**) to display the **COD** menu (*Access Code*).
  See page 30 for instructions on using this menu.

COD

- Press 🔲 (**+**) to display the **BUZ** menu (*Buzzer*).
  See page 31 for instructions on using this menu.

BUZ
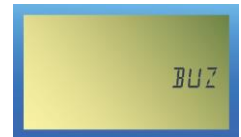
- Press the 🔲 (**-**) and 🔲 (**+**) buttons at the same time to quit the list of menus without activating them.

Menu Confirmation

Action or result	Illustration
■ Display the desired menu by following the instructions described in the above paragraph.	
■ Press 🔲 (**MENU/ENTER**) to confirm the menu to be used.	

Exiting a menu (escape)

Action or result	Illustration
■ While using a menu it is possible to exit by pressing 🔲 (**-**) **AND** 🔲 (**+**) together.	
■ The screen will display *Recording*. If necessary, press 🔲 (**-**) to select *No*. ■ Confirm by pressing 🔲 (**MENU/ENTER**).	EnrGNON

| Return to normal measurement display	
■ The screen will display the current measurement.	OLIE
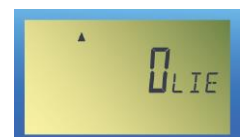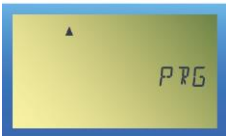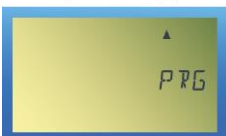
PRG Menu (Programming)

⚠️ To quit a menu at any stage, press the ⊟ (-) and ⊞ (+) buttons together.

This menu allows the user to program measurement channel configurations such as:

Action or result	Illustration
■ The **PRG** indicator blinks.	PRG
Selecting the channel to be programmed	
■ Confirm by pressing ▣ (**MENU/ENTER**). The *Channel 1* icon blinks indicating *Channel 1* has been selected.	1 2 PRG
■ To select *Channel 2*, press ⊞ (**+**). The *Channel 2* icon blinks indicating *Channel 2* has been selected.	1 2 PRG

■ Confirm the channel to be programmed by pressing ▣ (**MENU/ENTER**).
  - *ON* blinks.
  - The ━C icon is displayed.
  - The yellow fault indicator (Figure 2, ref. N) for the corresponding channel blinks. The alarm relays for the channel are blocked.
	On ━c

Start-up or stopping the channel	
■ Activating or deactivating the channel: - ⊟ (**-**) deactivates the channel (channel stopped).	OFF ━c
- ⊞ (**+**) activates the channel (channel in operation).	On ━c
■ Confirm by pressing ▣ (**MENU/ENTER**).	

Selecting the gas to be detected

- Press ⊟ (**-**) to display a list of the gases programmed. Then use 🔲 to display the other gases again.
- Confirm by pressing ⊞ (**MENU/ENTER**).

Selecting the unit of measurement

- Press ⊟ (**-**) or 🔲 (**+**) to display a list of the units programmed (%, LIE, PPM, PPB, UEG, C, BAR, MG, ----).
- Confirm by pressing ⊞ (**MENU/ENTER**).

Selecting the measurement scale

- The screen will display (for example):

- Press 🔲 (**+**) to modify the first digit of the measurement scale.
- Confirm by pressing ⊞ (**MENU/ENTER**).
- Use the same method for the other digits.
- Confirm by pressing ⊞ (**MENU/ENTER**).

Defining the *AL1* alarm threshold

- The alarm threshold indicator lights up (Figure 2, ref. F) and the screen will display (for example):
  - ▲: increasing alarm.
  - ⏸))1: *AL1* alarm.
  - *40*: current value for the alarm threshold.
  - *MAN*: see next step.
- Press ⊟ (**-**) or 🔲 (**+**) to define the first digit of the *AL1* alarm threshold. Confirm by pressing ⊞ (**MENU/ENTER**). Use the same method for the rest of the digits for the threshold.

Defining the direction (increasing/decreasing) for *AL1* alarm

- In this example, the display indicates ▲ (increasing alarm).
  - ▲: increasing alarm (icon blinks).
  - ⏸))1: *AL1* alarm.
  - *40*: current value for the alarm threshold.
  - *MAN*: see next step.
- To proceed directly to the next step, press ⊞ (**MENU/ENTER**).
- Press ⊟ (**-**) or 🔲 (**+**) to define the *AL1* alarm direction.

- ▲ : increasing alarm.
- ▼ : decreasing alarm.
■ Confirm by pressing 🔲 (**MENU/ENTER**).

Defining alarm acknowledgment (manual/automatic)

■ To proceed directly to the next step, press 🔲 (**MENU/ENTER**).

■ Press 🔲 (**-**) or 🔲 (**+**) to define the *AL1* alarm acknowledgment.

- *MAN* : 🔲 (**-**). Alarm clearing (acknowledgment) by pressing the 🔲 (**+**) button once the measurement is below the programmed alarm threshold.
- *AUT* : 🔲 (**+**). Automatic alarm clearing (acknowledgment) once the measurement is below the programmed alarm threshold.

■ Confirm by pressing 🔲 (**MENU/ENTER**).

Defining the time delay for triggering alarm relays

■ Press 🔲 (**-**) or 🔲 (**+**) to define the 4 digits for the time delay (in minutes, seconds) once the *AL1* alarm relay is engaged. Confirm the 4 digits by pressing 🔲 (**MENU/ENTER**)

Example: the value 10.20 indicates a delay of 10 minutes and 20 seconds.

| Alarm threshold exceeded | → | LED alarm and buzzer | → | Delay | → | Alarm relay switching |

Defining the *AL2* alarm threshold

■ Follow the same instructions for the *AL2* alarm threshold. Comply with the above paragraphs *Defining the AL1 alarm threshold* to *Defining the time delay for triggering alarm relays*.

Defining the time delay at start-up

■ Press 🔲 (**-**) or 🔲 (**+**) to define each of the 4 digits for the time delay (in minutes, seconds). Confirm the 4 digits by pressing 🔲 (**MENU/ENTER**)

Example: the value 10.20 indicates a time delay at start-up of 10 minutes and 20 seconds.

Defining the type of sensor

- To proceed directly to the next step, press 🔲 (**MENU/ENTER**).
- Press 🔲 (**-**) or 🔲 (**+**) to define the type of sensor connected.
  - *BRIDGE*: sensor (Wheatstone bridge output).
  - *EHP*: explosive sensor 4-20 mA.
  - *FIRE*: fire detector (ionic, optic, etc.).
  - *O2*: oxygen detector 4-20 mA.
  - *OTH*: another type of sensor (flame, etc.).
  - *MAN*: see next step.
- Confirm by pressing 🔲 (**MENU/ENTER**).

Defining the calibration mode for the sensor

- To proceed directly to the next step, press 🔲 (**MENU/ENTER**).
- The *MAN* indicator blinks.
- Press 🔲 (**-**) or 🔲 (**+**) to define the operating mode for the yellow sensor LED:
  - *MAN*: no visualization (blinking yellow LED) by the MX 32 controller, of the sensor being calibrated (sensor maintenance mode).
  - *OTH*: visualization (blinking yellow LED) on the controller when the sensor is being calibrated.
- Confirm by pressing 🔲 (**MENU/ENTER**).

Defining the time delay after calibration mode

(displaying a time)

- Press 🔲 (**-**) or 🔲 (**+**) to define the time delay (in minutes). Confirm the 4 digits by pressing 🔲 (**MENU/ENTER**)

Saving programming

- Press:
  - 🔲 (**+**) to select *Yes*. The programming completed will be used.
  - 🔲 (**-**) to select *No*. The changes will be abandoned and the old programming will be saved.
- Confirm by pressing 🔲 (**MENU/ENTER**).

Return to measurement display

■ Indicating the current measurement.

⚠️ If necessary, repeat the same procedure for the other channel.

INI Menu (Initialization)
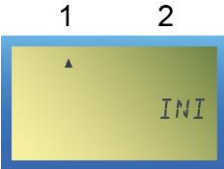
⚠️ To quit a menu at any stage, press the 🔲 (**-**) and 🔲 (**+**) buttons together.

This menu is used to automatically initialize the measurement curve managed by the microprocessor with the sensor connected to the appropriate channel. It is used in the following situations:

- By *Oldham* when shipping new material.

- At the initial installation.

- When changing a sensor or a detector.

Action or result	Illustration
■ The *INI* indicator blinks.	INI

Selecting the channel to initialize

■ Press 🔲 (**ENTER**) to confirm. The *Channel 1* icon blinks indicating *Channel 1* has been selected.	1　　2	INI
■ To select *Channel 2*, press 🔲 (**+**). The *Channel 2* icon blinks indicating *Channel 2* has been selected.	1　　2	INI
■ Confirm the channel to initialize by pressing 🔲 (**ENTER**). 　- *ON* blinks. 　- The ▬**C** icon is displayed. 　- The yellow indicator of the corresponding channel blinks (the channel relays are blocked).	1　　2	INI

Confirming initialization

■ Press: 　- 🔲 (**+**) to select *Yes*. The initialization will launch. 　- 🔲 (**-**) to select *No*. The initialization will be abandoned. ■ Confirm by pressing 🔲 (**MENU/ENTER**).	*EnrG*NON

Return to normal measurement display

- The screen will display the current measurement.

⚠️ Important: once the settings are completed, perform a new calibration for this measurement channel; see the following paragraph.

Cal Menu (Calibration)

To quit a menu at any stage, press the ⬚ (-) and ⬚ (+) buttons together.

Caution: the settings operations in this paragraph are reserved for authorized, trained personnel because they may compromise detection reliability.

The user must refer to the gas detector manual for calibration of detectors.

The only way to verify the accuracy of the detection function of the sensor(s) linked to the *MX 32* controller is through calibration using a test gas.

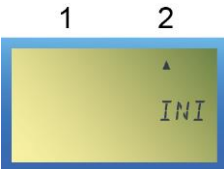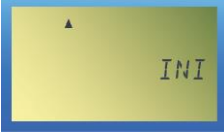Gas detectors are safety devices. Accordingly, *Oldham* recommends regular testing of fixed gas detection installations. This type of test consists of injecting a standard gas of sufficient concentration into the sensor to set off the pre-adjusted alarms. This test does not, in any event, replace a full calibration of the sensor.

Oldham also recommends completely calibrating detectors with a known and certified concentration of gas every 3 or 4 months.

Frequency of gas testing depends on the industrial application in which the sensors are used. Inspection should occur frequently during the months following installation start up, later it may be spaced out if no significant problem is observed. Time intervals between tests should not exceed 3 months.

If a detector does not react upon contact with gas, it must be calibrated. Calibration frequency should be adapted based on test results. However, it should not be greater than one year.

Oldham recommends using a test gas to calibrate detectors.

The site manager is responsible for implementing the safety procedures on his site. *Oldham* is not responsible for implementing safety procedures.

Reminder: for security reasons, only trained personnel should be authorized to use the following menus.

The Calibration menu will allow the user to perform zero control and settings in a clean environment and the sensitivity of the test gas.

Calibration can be performed:

- After initialization; see the following page.

- For preventative maintenance (minimum and regular service); see page 28.

After initialization

Action or result	Illustration
■ The **CAL** indicator blinks.	

Selecting the channel to calibrate

■ Press [MENU/ENTER] (**ENTER**) to confirm. The *Channel 1* icon blinks indicating *Channel 1* has been selected.	1 2
■ To select *Channel 2*, press [+] (**+**). The *Channel 2* icon blinks indicating *Channel 2* has been selected.	1 2

Zero settings

■ Confirm the channel to calibrate by pressing [MENU/ENTER] (**ENTER**). - Display of the current value. *X0* = zero settings. - The ▬C icon is displayed. - The yellow indicator of the corresponding channel blinks (the channel relays are blocked).	1 2
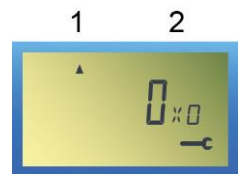
■ Make sure that the air is clean, if not, using a test kit, inject air at the level of the detector at a flow rate of 60 l/h, then wait for stabilization of the signal.

If the display is not zero, adjust the zero measurement by moving the zero potentiometer corresponding to the appropriate channel (Figure 4, ref. R for *Channel 1* or ref. O for *Channel 2*).

■ Confirm the zero by pressing [MENU/ENTER] (**ENTER**).

Sensitivity settings

- Inject the calibration gas (60 l/h) at sensor level and wait for signal stabilization.

- Confirm the entry in the sensitivity settings by pressing [MENU ENTER] (**ENTER**).
  - Display of the current value.
    XF = setting the.
  - The ━c icon is displayed.
  - The yellow indicator of the corresponding channel blinks (the channel relays are blocked).

  If necessary (display other than the value of the calibration gas), adjust the sensitivity by moving the sensitivity potentiometer corresponding to the appropriate channel (Figure 4, ref. Q for *Channel 1* or ref. P for *Channel 2*).

- Confirm the sensitivity by pressing [MENU ENTER] (**ENTER**).

  Caution: never confirm without having injected gas and completed the settings, at the risk of false triggering.

Saving calibration

- Press:
  - [x̄] (**+**) to select *Yes*. The completed calibration will be saved.
  - [TEST] (**-**) to select *No*. The changes will be abandoned and the old calibration will be saved.
- Confirm by pressing [MENU ENTER] (**MENU/ENTER**).

Return to measurement display

- The screen will display the current measurement.

Preventative maintenance

Action or result	Illustration
■ The **CAL** indicator blinks.	

Selecting the channel to calibrate

|	
■ Press ⌨ (**ENTER**) to confirm. The *Channel 1* icon blinks indicating *Channel 1* has been selected.	1　2
■ To select *Channel 2*, press 🔲 (**+**). The *Channel 2* icon blinks indicating *Channel 2* has been selected.	1　2

Zero settings

■ Confirm the channel to calibrate by pressing ⌨ (**ENTER**).
  - Display of the current value (±0).
    X0 = zero settings.
  - The ━C icon is displayed.
  - The yellow indicator of the corresponding channel blinks (the channel relays are blocked).
	1　2
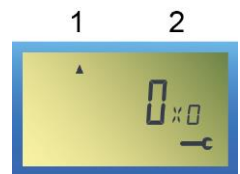
■ Make sure that the air is clean, if not, using a test kit, inject air at the level of the detector at a flow rate of 60 l/h, then wait for stabilization of the signal. If the display is a value other than zero, adjust the zero measurement using the 🔲 (**+**) or 🔲 (**-**) buttons.	

Sensitivity settings

■ Inject the calibration gas (60 l/h) at sensor level and wait for signal stabilization.	

■ Confirm the entry in the sensitivity settings by pressing ⌨ (**ENTER**).
  - Display of the current value (±0).
    XF = sensitivity settings (blinking icon).
  - The ━C icon is displayed.
  - The yellow indicator of the corresponding channel blinks (the channel relays are blocked).
 	
If necessary (displayed value other than the value of the calibration gas), adjust the sensitivity by using the 🔲 (**+**) or 🔲 (**-**) buttons.
	1　2

- Confirm the sensitivity by pressing ▣(**ENTER**).

  Caution: never confirm without having injected gas and completed the settings, at the risk of false triggering.

Saving calibration

- Press:
  - ▣ (**+**) to select *Yes*. The completed calibration will be saved.
  - ▣ (**-**) to select *No*. The changes will be abandoned and the old calibration will be saved.
- Confirm by pressing ▣ (**MENU/ENTER**).

Return to measurement display
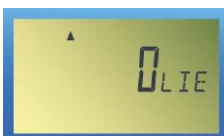
- The screen will display the current measurement.
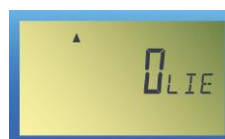
Cod Menu (Access code)

⚠️ To quit a menu at any stage, press the ⌑ (**-**) and ⌑ (**+**) buttons together.

Action or result	Illustration
▪ The **COD** indicator blinks. ▪ Press ⌑ (**ENTER**) to confirm.	▲ % *COD*
Defining the code	
▪ The current code is displayed.	*1000*COD
▪ The first digit blinks. Enter the first digit of the new code using the ⌑ (**+**) or ⌑ (**-**) buttons. ▪ Confirm the first digit by pressing ⌑(**ENTER**).	*1000*COD
▪ Proceed to the next stage for each of the other 3 digits in the code.	
Saving the new code	

▪ Press:
  - ⌑ (**+**) to select *Yes*. The new code will be saved.
  - ⌑ (**-**) to select *No*. The changes will be abandoned and the old code will be saved.
▪ Confirm by pressing ⌑ (**MENU/ENTER**).
	▲
	*Enr G*NON
	🔧

Return to measurement display	
▪ The screen will display the current measurement.	▲ *0*LIE

Buz Menu (Buzzer)

Action or result	Illustration
■ The **BUZ** indicator blinks. ■ Press [MENU/ENTER] (**ENTER**) to confirm.	*BUZ*

Defining the buzzer action

■ The *ON* or *OFF* icon blinks, depending on the current buzzer configuration.	*On BUZ*
■ Select *On* or *Off*: 　- *On*: the *buzzer* will be activated in the case of alarm or a fault. Press [+] (**+**). 　　*OFF*: the *buzzer* will not be activated in the case of alarm or a fault. Press [TEST] (**-**). ■ Press [MENU/ENTER] (**ENTER**) to confirm.	*OFF BUZ*

Saving the new buzzer settings

■ Press: 　- [+] (**+**) to select *Yes*. The new *buzzer* settings will be saved. 　- [TEST] (**-**) to select *No*. The old *buzzer* settings will be saved. ■ Confirm by pressing [MENU/ENTER] (**MENU/ENTER**).	*EnrⁿNON*

Return to measurement display

■ The screen will display the current measurement.	*OLIE*

Chapter 5 | Cleaning, servicing and maintenance

Cleaning

Do not use alcohol- or ammonia-based liquids to clean the central controller. If necessary, clean the exterior of the enclosure with a damp cloth.

Maintenance and servicing

The controller does not require special servicing.

Adjustments

⚠️ Caution: the settings operations in this paragraph are reserved for authorized, trained personnel because they may compromise detection reliability.

If it is necessary to re-adjust the sensors, this operation must only be completed by a qualified personnel. First, the front cover must be opened (Figure 2, ref. P) on the controller. Refer to the *Viewing the menus* paragraph on page 16.

Zero adjustment

Use the following settings:

- Channel 1: P3 (Figure 4, ref. R).
- Channel 2: P4 (Figure 4, ref. O).

Sensitivity adjustments

Use the following settings:

- Channel 1: P5 (Figure 4, ref. Q).
- Channel 2: P6 (Figure 4, ref. R).

Calibration

Gas detectors are safety devices. Accordingly, OLDHAM recommends regular testing of fixed gas detection installations. This type of test consists of injecting a standard gas of sufficient concentration into the sensor to set off the pre-adjusted alarms. This test does not, in any event, replace a full calibration of the sensor.

Frequency of gas testing depends on the industrial application in which the sensors are used. Inspection should occur frequently during the months following installation start up, later it may be spaced out if no significant problem is observed.

> ⚠️ **If a detector does not react upon contact with gas, it must be calibrated. Calibration frequency should be adapted based on test results. However, it should not be greater than one year.**

Safety Procedures

The site manager is responsible for implementing the safety procedures on his site. *Oldham* is not responsible for implementing safety procedures.

- Refer to the *Menu Initialization* paragraphs (page 23).

- Do not forget to complete a system start-up after changing the sensor by using the "INI" menu (*Menu Initialization (INI)* paragraph, on page 23).

Fuse replacement

Replacement of the fuses should only be performed by a qualified professional. The fuses in use must conform to CEI 127 regulations (time-delayed, low breaking capacity, 250 V AC power source). Please see the following paragraph.

Parts

Description	Reference
Fuse F7 (2 A T, 250 V AC) – Versions 115 or 230 V AC.	6 154 624
Fuse F8 (315 mA T, 250 V AC) – Version 115 V AC.	6 154 722
Fuse F8 (160 mA T, 250 V AC) – Version 230 V AC.	6 154 723
Fuse F9 (315 mA T, 250 V AC) – Version 115 V AC.	6 154 722
Fuse F9 (160 mA T, 250 V AC) – Version 230 V AC.	6 154 723
Fuse F11 (630 mA T, 250 V AC).	6 154 627
Fuse F13 (630 mA T, 250 V AC).	6 154 627
Programming strip 340 mA	6 353 442
Programming strip 4-20 mA	6 353 443
Dual channel analog card	6 451 476
Single channel analog card	6 451 477
Channel extension card	6 451 478
Micro card (display)	6 451 475

Chapter 6 | Technical specifications

Chapter 7 | Technical specifications

Case	
Enclosure:	wall-mount.
Dimensions:	240 x 205 x 120 mm.
Material:	ABS plastic
Cable input/outputs:	6 x PG9 type cable glands.
Protection:	IP65.
Power supply	
Power supply:	■ 115 or 230 VAC. ■ 21 V to 30 V DC.
Power consumption:	30 VA.
Connections	
Type:	spring terminal.
Cable diameter:	2.5 mm² maximum.
Measurement Channels	
Number:	1 or 2.
Type:	■ Wheatstone bridge type explosive sensor. ■ 4/20 mA to 2 or 3 fils.
Measurement:	simultaneous channel measurement.
Measurement Ranges	
Type :	programmable independently for each channel.
Number of measurement points:	continuous programming from 0 to 9999.
Display	
Position:	on the front.
Type:	■ liquid-crystal display (LCD). ■ 4 digits of 7 segments each, 3 characters of 14 segments each, fixed or drop-down icons for each channel. ■ 4 light-emitting diodes (LEDs) per channel (on, AL1, AL2, fault).
Unit description:	definable for each channel.
Gas description:	definable for each channel.
Keypad:	buttons for menu access, indicators and acknowledgment.

Alarms	
Type:	■ 2 independent thresholds per channel defined by the user. ■ manual or automatic clearing for increasing or decreasing values as programmed. ■ visualization with red indicator. ■ output relays (alarms 1 and 2).
Relay:	■ 2 independent alarm relays per channel energized or de-energized, programmable by the manufacturer. ■ 1 relay with energized disturbance. ■ open or closed contact configurable for all the relays using a switch.
Breaking capacity:	2A - 250 VAC, 2A - 30 VDC.
LED:	4 electroluminescent diodes.

Integrated audible alarm:	■ buzzer.
	■ alarm sound level:
	  - to 50 cm: 72 to 74 dB.
	  - to 100 cm: 66 to 68 dB.

Sensors	
	■ 1 OLC 10 combustible gas detector or 2 OLC 10 TWIN detectors for the detection of methane, butane, propane in boiler rooms and LPG, CNG or H2 in parking lots. ■ 1 OLCT 10 combustible gas detector for the detection of methane, butane, propane in boiler rooms and LPG, CNG or H2 in parking lots. ■ 1 to 5 detectors, also OLCT 10 for the detection of CO, NO and NO2.
Cable length (1.5 mm² diameter).	
	■ Wheatstone bridge: 300 m max. per channel ■ 4 / 20 mA: 2000 m max. per channel.
Operating conditions	
Ambient temperature:	-10 to +55°C
Storage temperature:	-10 to +45°C
Humidity:	5 to 95 % non condensing
Certifications	
ATEX Directive 94/9/EC:	category (3) G for metrology in the detection of explosive gases EN 61779-1 and 4 in Zone 2.
Low Voltage Directive:	in compliance with EN 61010-1:10.
Electromagnetic Compatibility (EMC) Directive:	in compliance with EN 50270:06.

Chapter 8 | Particular Specifications

Particular Specifications for use in Explosive Atmospheres in Accordance with the European ATEX 94/9/CE Directive.

The *MX 32* detection controller intended for the measurement of explosive gases, conforms to European ATEX Directive 94/9/CE pertaining to explosive atmospheres.

Due to their metrological performances as tested by INERIS (French National Institute for Industrial Environment and Risks), the *MX 32* paired with *Oldham* CEX 300 and TBGW-EX detectors as well as those in the OLC/OLCT series: 20, 40, 50, 60, 100 and OLCT IR is classified as a safety device. The controller can also reduce the risk of explosion by sending data to outside units.

Information in following paragraphs must be taken into account and followed by the person responsible for the equipment installation site. Refer to the provisions of European ATEX Directive 1999/92/EC, concerning the improvement of safety protection and the health of workers exposed to the risks of explosive atmospheres.

Specifications for mechanical and electrical installations in Explosive Zones.

All installations must be in compliance with currently enforced standards, notably standards EN 60079-14, EN 60079-17, and EN 50281-1-2.

The *MX 32* controller must not be subject to intense mechanical vibration and must be installed in a safe area away from explosive atmospheres.

It is very important to refer to the user and start-up manuals for the gas detectors being used.

For intrinsically safe installations, the person responsible for the IS installation, called "the system designer," must establish a system document demonstrating that the entire Sensor/Cable/Power Supply system is Intrinsically Safe. See the EN 50039 standard for group II and the EN 50394-1 standard for group I to prepare this document.

Metrological specifications

The controller conforms with the following European standards.

With Explosive Gas Detectors
- European standards EN 50054 and EN 50057 for methane (calibration gas), propane and hydrogen gases (gas following response curves), when

the controller is used with CEX 300 gas detectors and those in the OLC/OLCT series including 20, 40, 50, 60, 100 and OLCT IR. Where the controller is used with other types of detectors delivering a current of 4/20 mA, they must conform to ATEX Directive 94/9/EC, Annex II, paragraph 1.5 and be compatible with the characteristics described therein (refer to the controller transfer curve in Figure 10).

■ European standard EN 50271.

Oxygen gas detectors

■ European standard EN 50104 when the controller is used with OLCT 20, 40, 50, 60 and TBGW-EX gas detectors. Where the controller is used with other types of detectors delivering a current of 4/20 mA, they must conform to ATEX Directive 94/9/EC, Annex II, paragraph 1.5 and be compatible with the characteristics described therein (refer to the controller transfer curve in Figure 11).

■ European standard EN 50271.

Connecting detectors other than *Oldham* detectors to the *MX 32* controller

Any user wishing to use detectors other than *Oldham* detectors must ensure that they are compatible with the controller, in order for the unit to be considered a safety device.

Configuration transfer curve 0 to 100 % LEL

The following curve demonstrates the controller response in terms of values measured and treatment of faults, as a function of the value of the input current delivered by the detector. In the case that the user connects a non-*Oldham* brand detector to the *MX 32* controller, the user must ensure that the transfer curve is compatible with the input characteristics for the controller, so that the information delivered by the detector will be properly interpreted. In addition, the controller must provide sufficient supply voltage, taking into account voltage drops in the cables.

Figure 10: Configuration transfer curve 0 to 100 % LEL

> ⚠️ Caution: when the measurement is above or equal to 100 % LEL, the measurement controller records that the scale has been exceeded; the channel switches to alarm and fault mode. The user is responsible for manually rearming these settings, following the safety regulations applicable at their site. Rearming can be accomplished by restarting the controller or through a maintenance operation.

Configuration transfer curve 0 to 30.0 % oxygen

The following curve demonstrates the controller response in terms of values measured and treatment of faults, as a function of the value of the input current delivered by the detector. In the case that the user connects a non-*Oldham* brand detector to the *MX 32* controller, the user must ensure that the transfer curve is compatible with the input characteristics for the controller, so that the information delivered by the detector will be properly interpreted. In addition, the controller must provide sufficient supply voltage, taking into account voltage drops in the cables.
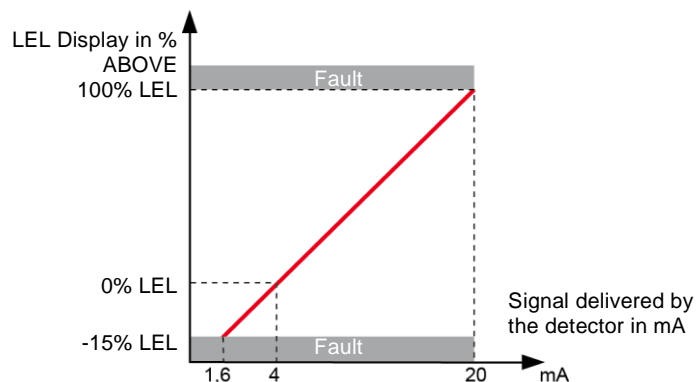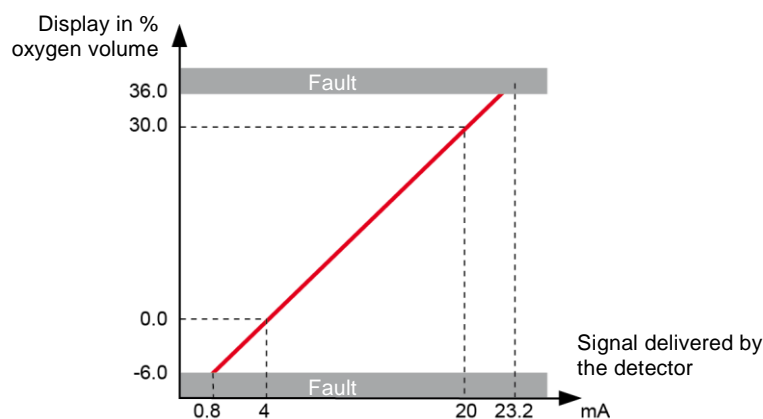

Figure 11: Configuration transfer curve 0 to 30 % oxygen

Power supply and resistance characteristics

- Maximum current available between terminals 2 and 3: 250 mA under 19 V.

- Maximum voltage without load between terminals 2 and 3: 30 V.

- Resistance (outside of the intrinsic safety barrier) between terminals 1 and 2: 47 ohm.

Markings:

OLDHAM Arras

$C \epsilon$ 0080

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